

REMARKS

This Amendment cancels claim 7 and amends claim 6 in accordance with the original disclosure. Claims 6 and 8-9 remain in this application. In view of these amendments and of the following remarks, Applicants submit that all the claims are now in condition for allowance.

35 U.S.C. § 102(f)

The Examiner rejects claim 6 under 35 U.S.C. § 102(f) asserting that Applicants did not invent the claimed subject matter, as U.S. Patent Nos. 6,624,183; 6,297,236 and 6,620,822 each disclose the combination of prothioconazole with at least one of the other fungicidal compounds.

The present application claims priority to DE 197 16 257.6, filed on April 18, 1997. Thus, it is clear that Applicants conceived and reduced the claimed invention to practice before April 18, 1997 in order to file the application.

U.S. Patent No. 6,297,236 was filed on April 6, 1998. This is almost a year after Applicants filed their first application on the claimed invention. U.S. Patent No. 6,624,183 claims priority to applications filed on December 13, 1999 and May 3, 2000 (over two and a half years after Applicants filed their first application). U.S. Patent No. 6,620,822 claims priority to an application filed on July 20, 1999 (again, over two years after Applicants filed their first application on the claimed subject matter). Applicants believe it is abundantly clear that Applicants were the first to conceive and reduce to practice the claimed invention and that Applicants did not (and could not) derive the claimed invention from the work or references filed years after Applicants conceived and reduced to practice the claimed invention.

If, in light of the above discussion, the Examiner maintains this rejection, Applicants will submit a Declaration Under 37 C.F.R. § 1.132 attesting to the fact that Applicants did not (and could not) derive the claimed invention from work or references filed well after Applicants filed their application on the claimed invention.

Obviousness

Claims 6-9 stand rejected under 35 U.S.C. § 103(a) for asserted obviousness in view of U.S. Patent No. 3,903,090 (hereinafter "the '090 patent"). The Examiner states that although the '090 patent does not disclose the combination of prothioconazole with other fungicides, it suggests the same because it is known that the compounds used singly are effective fungicides which can be combined together and formulated with suitable extenders.

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The '090 patent discloses N-(3,4-dihalophenyl)imide compounds that exhibit an antimicrobial activity against microorganisms such phytopathogenic fungi, parasites of industrial products and pathogenic microorganisms. The Examiner refers Applicants to the text passage in column 32, line 20 *et seq.* which states that the N-(3,5-dihalophenyl)imide compounds may be used as agricultural chemicals for prevention or inhibition of plant diseases caused by phytopathogenic fungi. Additionally, the '090 patent teaches that the N-(3,5-dihalophenyl)imide compounds may be used together with one or more known fungicides, insecticides and herbicides. Thus, the '090 patent mentions an extensive number of compounds suitable for use in combination with N-(3,5-dihalophenyl)imide compounds. Therefore, the Examiner concludes that one of ordinary skill in the art would have been motivated to combine prothioconazole with one or more fungicides based on the disclosures of the '090 patent.

Applicants respectfully submit that the above interpretation of the '090 patent is incorrect for the following reasons.

First, it would have been impossible for the '090 patent to teach or suggest the combination of prothioconazole with the compound of formula (XV) because prothioconazole was not yet developed at the effective filing date of the '090 patent. Hence, the '090 patent necessarily is silent as to a combination of a compound of formula (XV) with prothioconazole and, of course, prothioconazole is not mentioned in the list of suitable fungicides in column 32, line 20 *et seq.* of the '090 patent. Additionally, the compound of formula (XV) (procymidone) is the only compound of the present invention having an N-(3,5-dihalophenyl)imide structure. Therefore, a fair reading of the '090 patent would not direct a skilled artisan to use active compound combinations comprising prothioconazole and an N-(3,5-dihalophenyl)imide compound nor would one skilled in the art be motivated to do so with a reasonable expectation of success.

Second, the compound of formula (XV) (procymidone), which is the only N-(3,5-dihalophenyl)imide compound provided in the present invention, is merely one of a plurality of N-(3,5-dihalophenyl)imide compounds disclosed in the '090 patent (see Tables 39-48). Applicants submit that the general disclosure of one compound contained in a long list of compounds does not teach or suggest and would not direct or motivate one skilled in the art to choose the compound of formula (XV) out of the extensive group of similarly related structures provided in the '090. Based on such a

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generic disclosure, Applicants contend that it is only with knowledge of the claimed invention that one might work backwards, in hindsight, to purport that the '090 patent suggests the combination of the N-(3,5-dihalophenyl)imide compound and prothioconazole. Furthermore, even though the '090 patent does not point to or even hint at choosing the compound of formula (XV), this compound is not the best compound disclosed in the '090 patent. In particular, see Tables 5, 6, 8 and 10, in which test results are provided showing that the compounds described therein have better activity with respect to diseased spots per leaf (e.g., compounds 9 of Table 6; compound 4 of Table 7; compound 1 of Table 8; and compounds 1 and 4 of Table 10). Additionally, these compounds are used in smaller amounts. Applicants submit, therefore, that the test results actually would teach away from choosing the compound of formula (XV) out of the extensive list disclosed in the '090 patent in order to combine this compound with prothioconazole as proposed in the present invention.

Moreover, the present invention as now claimed in amended claim 1 recites exact mixtures of the compounds in question with given ratios of all active parts. In contrast, the '090 patent is completely silent as to the exact ratio of prothioconazole to compounds (1) to (24). As mentioned in the instant application, surprising and unexpected synergistic effects are achieved and are particularly pronounced when the active compounds according to the present invention are present in certain weight ratios. In particular, the active compound combinations show a fungicidal activity which is considerably higher than the sum of the activities of the individual active compounds. Applicants submit that the '090 patent neither teaches nor suggests the unexpected finding of the claimed invention; namely, the specific combination of compounds and the weight ratios of this specific combination of compounds which results in the surprising synergistic effects of this combination of compounds.

To substantiate that the claimed invention which inheres in a combination of compounds present in certain weight ratios and which produces unexpected, surprising synergistic fungicidal, herbicidal and/or insecticidal effects, it is necessary to understand what one skilled in the art would normally expect when combining two active fungicidal, herbicidal and/or insecticidal compounds. Knowledge of what a skilled artisan would expect can be found in the literature, such as, for example, in Colby, S.R., "Calculating Synergistic and Antagonistic Responses of Herbicide Mo5334 D

Compositions," *Weeds*, 15:20-22, 1967. This reference provides the following formula, referred to as the "Colby-formula," to calculate the expected activity for a given combination of two active compounds:

$$E = X + Y - (X \times Y / 100)$$

wherein

X is the efficacy when applying active compound A at an application rate of m g/ha;

Y is the efficacy when applying active compound B at an application rate of n g/ha;

and

E is the efficacy when applying the active compounds A and B at an application rate of m and n g/ha; (see page 22 of the present application).

The Colby-formula represents what one skilled in the art would expect if two active compounds were combined as proposed by the present invention. As described in the present application, the combination of active compounds leads to compositions having a greater activity than the values calculated for the expected efficacy calculated by the Colby-formula. Therefore, contrary to the Examiner's assertion that one skilled in the art would expect synergistic effects when combining two or more compounds, the Colby reference clearly shows that this is not the case.

Therefore, the synergistic effects exhibited by the compositions of the present invention is notable evidence of nonobviousness, as stated in MPEP, Section 716.02(a):

A greater than expected result is an evidentiary factor pertinent to the legal conclusion of obviousness... of the claims at issue. *In re Corkhill*, 711 F.2d 1496, 226 U.S.P.Q. 1005 (Fed. Cir. 1985). In *Corkhill*, the claimed combination showed an additive result when a diminished result would have been expected. This result was persuasive of nonobviousness even though the result was equal to that of one component alone. **Evidence of a greater than expected result may also be shown by demonstrating an effect which is greater than the sum of each of the effects taken separately** (i.e., demonstrating "synergism"). *Merck & Co. Inc. v. Biocraft Laboratories Inc.*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), *cert. denied*, 493 U.S. 975 (1989). (...) However, a greater than additive effect is not necessarily sufficient to overcome a *prima facie* case of obviousness because such an effect can either be expected or unexpected. Applicants must further show that the results were **greater than those which would have been expected from the prior art to an unobvious extent**, and

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that the results are of a significant, practical advantage. *Ex parte The NutraSweet Co.*, 19 USPQ2d 1586 (Bd. Pat. App. & Inter. 1991).

Evidence of unexpected properties also must be weighted, as stated in MPEP, Section 716.02(c):

Evidence of unexpected results must be weighted against evidence supporting prima facie obviousness in making a final determination of the obviousness of the claimed invention. In re May, 574 F.2d 1082, 197 USPQ 601 (CCPA 1978). (Claims directed to a method of effecting analgesia without producing physical dependence by administering the levo isomer of a compound having a certain chemical structure were rejected as obvious over the prior art. Evidence that the compound was unexpectedly nonaddictive was sufficient to overcome the obviousness rejection. Although the compound also had the expected result of potent analgesia, there was evidence of record showing that the goal of research in this area was to produce an analgesic compound which was nonaddictive, enhancing the evidentiary value of the showing of nonaddictiveness as an indicia of nonobviousness). See MPEP Section 716.01(d) for guidance on weighing evidence submitted to traverse a rejection.

Based on the foregoing, Applicants submit that the '090 patent neither teaches nor suggests the unexpected results achieved using the combination of active compounds in certain weight ratios as provided in the claimed invention, results which are greater than what would be expected as calculated with the Colby-formula and which lead to significant, practical advantages of the claimed invention over the prior art.

Claims 6-9 stand rejected under 35 U.S.C. § 103(a) for asserted obviousness over WO 96/16048. The Examiner states that although WO 96/16048 does not expressly disclose the combination of prothioconazole with other fungicides, it amply suggests the same as it is known that the compounds used singly are effective fungicides, that prothioconazole can be combined with other fungicides and that they can be formulated with surfactants and extenders.

All of the above arguments made by Applicants to rebut the assertion of obviousness in view of the '090 patent are applicable to and are therefore reiterated with respect to the WO 96/16048 reference.

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Additionally, Applicants point out that although WO 96/16048 discloses that prothioconazole can be combined with other disclosed active compounds, and WO 96/16048 generally states that synergistic results may be obtained, in fact, no examples, especially for the claimed compositions, are provided which show that the claimed compositions provide synergistic activity. Hence, Applicants submit that the general disclosure of an extended list of fungicides which can be combined, as provided in WO 96/16048, does not teach or suggest, or motivates one skilled in the art to expect, the unexpected result of synergistic effects achieved using the specific combination of active compounds in specific weight ratios as provided in the claimed invention.

Based on the foregoing amendments, Applicants respectfully request allowance of all pending claims 6, 8 and 9.

Respectfully submitted,

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